

WHAT IS CLAIMED IS:

1 1. An assay for identifying a compound useful for blocking CMV
2 dissemination is a host, comprising the step of determining whether said compound
3 inhibits the binding of a chemokine to US28 or a US28 fragment.

1 2. An assay in accordance with claim 1, wherein said chemokine is
2 selected from the group consisting of fractalkine, MIP-1 α , MIP-1 β , MCP-1 and
3 RANTES.

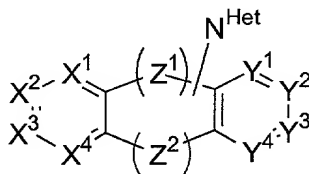
1 3. An assay in accordance with claim 1, wherein said chemokine is
2 fractalkine.

1 4. An assay in accordance with claim 1, wherein said step of
2 determining comprises specifically binding labeled fractalkine to the ligand binding
3 domain of US28.

1 5. A method for preventing dissemination of CMV in a human,
2 comprising administering an effective amount of a compound which blocks the binding of
3 a chemokine to US28 or a US28 fragment.

1 6. A method in accordance with claim 5, wherein said compound was
2 identified by the assay of claim 1.

1 7. A method in accordance with claim 5, wherein said compound has
2 the formula:



3
4 wherein

5 X¹, X², X³ and X⁴ are each independently members selected from the group
6 consisting of N and C-R¹, wherein R¹ is a member selected from the group
7 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
8 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
9 and di(C₁-C₄)alkylamino;

Y¹, Y², Y³ and Y⁴ are each independently members selected from the group consisting of N and C-R², wherein R² is a member selected from the group consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl, (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino, and di(C₁-C₄)alkylamino;

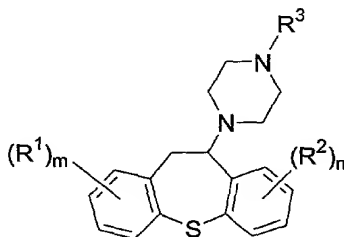
Z¹ is a divalent moiety selected from the group consisting of (C₁-C₃)alkylene;

Z² is a divalent moiety selected from the group consisting of -O-, -S- and -N(R³)- wherein R³ is a member selected from the group consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl, (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino, and di(C₁-C₄)alkylamino; and

N^{Het} is a substituted or unsubstituted 4-, 5-, 6-, or 7-membered nitrogen heterocycle.

8. A method in accordance with claim 7, wherein X¹, X³, X⁴, Y¹, Y², Y³ and Y⁴ are all CH; Z² is -S-, and N^{Het} is a substituted 6-membered nitrogen heterocycle.

9. A method in accordance with claim 5, wherein said compound has the formula:



wherein

the subscripts m and n are independently integers of from 0 to 3;

R¹ and R² are substituents independently selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio, (C₁-C₄)haloalkyl, (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino, and di(C₁-C₄)alkylamino; and

R³ is a substituent selected from the group consisting of (C₁-C₄)alkyl, (C₁-C₄)haloalkyl and (C₁-C₄)acyl.

10. A method in accordance with claim 9, wherein m is 0 and n is 1.

11. A method in accordance with claim 9, wherein m is 0, n is 1 and R² is selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio and (C₁-C₄)haloalkyl.

12. A method in accordance with claim 9, wherein m is 0, n is 1 and R² is selected from the group consisting of halogen and (C₁-C₄)alkylthio.

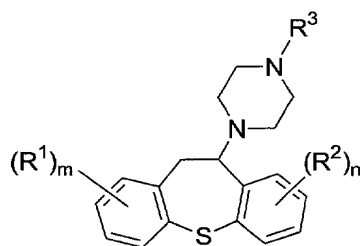
13. A method in accordance with claim 5, wherein said compound is selected from the group consisting of methiothepin, octoclothepin and pharmaceutically acceptable salts thereof.

14. A method for reducing cell motility in a CMV-infected cell, said method comprising contacting said CMV-infected cell with a motility-reducing amount of a compound that inhibits chemokine binding to US28 on the surface of said infected cell.

15. A method in accordance with claim 14, wherein said chemokine is a member selected from the group consisting of fractalkine, MIP-1 α , MIP-1 β , MCP-1 and RANTES.

16. A method in accordance with claim 14, wherein said chemokine is fractalkine.

17. A method in accordance with claim 14, wherein said compound has the formula:



wherein

the subscripts m and n are independently integers of from 0 to 3;

R¹ and R² are substituents independently selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio, (C₁-C₄)haloalkyl, (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino, and di(C₁-C₄)alkylamino; and

10 R³ is a substituent selected from the group consisting of (C₁-C₄)alkyl, (C₁-
11 C₄)haloalkyl and (C₁-C₄)acyl.

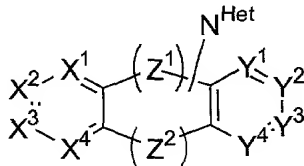
1 18. A method in accordance with claim 17, wherein m is 0 and n is 1.

1 19. A method in accordance with claim 17, wherein m is 0, n is 1 and
2 R² is selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-
3 C₄)alkylthio and (C₁-C₄)haloalkyl.

1 20. A method in accordance with claim 17, wherein m is 0, n is 1 and
2 R² is selected from the group consisting of halogen and (C₁-C₄)alkylthio.

1 21. A method in accordance with claim 14, wherein said compound is
2 selected from the group consisting of methiothepin, octoclotheptin and pharmaceutically
3 acceptable salts thereof.

1 22. A pharmaceutical composition comprising a pharmaceutically
2 acceptable carrier and a compound of the formula:



3
4 wherein

5 X¹, X², X³ and X⁴ are each independently members selected from the group
6 consisting of N and C-R¹, wherein R¹ is a member selected from the group
7 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
8 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
9 and di(C₁-C₄)alkylamino;

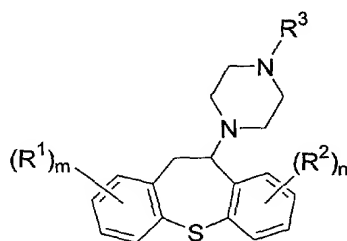
10 Y¹, Y², Y³ and Y⁴ are each independently members selected from the group
11 consisting of N and C-R², wherein R² is a member selected from the group
12 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
13 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
14 and di(C₁-C₄)alkylamino;

15 Z¹ is a divalent moiety selected from the group consisting of (C₁-C₃)alkylene;

16 Z^2 is a divalent moiety selected from the group consisting of -O-, -S- and -N(R³)-
 17 wherein R³ is a member selected from the group consisting of H, halogen,
 18 (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl, (C₁-C₄)haloalkoxy, nitro,
 19 cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino, and di(C₁-C₄)alkylamino;
 20 and
 21 N^{Het} is a substituted or unsubstituted 4-, 5-, 6-, or 7-membered nitrogen
 22 heterocycle.

1 23. A composition in accordance with claim 22, wherein X¹, X³, X⁴,
 2 Y¹, Y², Y³ and Y⁴ are all CH; Z² is -S-, and N^{Het} is a substituted 6-membered nitrogen
 3 heterocycle.

1 24. A composition in accordance with claim 22, wherein said
 2 compound has the formula:



3
 4 wherein
 5 the subscripts m and n are independently integers of from 0 to 3;
 6 R¹ and R² are substituents independently selected from the group consisting of
 7 halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio, (C₁-C₄)haloalkyl,
 8 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
 9 and di(C₁-C₄)alkylamino; and
 10 R³ is a substituent selected from the group consisting of (C₁-C₄)alkyl, (C₁-
 11 C₄)haloalkyl and (C₁-C₄)acyl.

1 25. A composition in accordance with claim 24, wherein m is 0 and n
 2 is 1.

1 26. A composition in accordance with claim 24, wherein m is 0, n is 1
 2 and R² is selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-
 3 C₄)haloalkyl and (C₁-C₄)alkylthio.

